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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,436	08/26/2003	Hung-Jen Hsu	252011-1610	5190

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THOMAS, KAYDEN, HOSTEMEYER & RISLEY LLP
100 GALLERIA PARKWAY
SUITE 1750
ATLANTA, GA 30339

EXAMINER	
WILLIAMS, DON J	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/649,436	HSU ET AL.	
	Examiner	Art Unit	
	Don Williams	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *6 August 2003; 4 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 11/4/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Summa (US2002/0140832).

As to claim 1, Summa discloses an image sensor (10) with improved uniformity of effective incident light with a chip having a plurality of sensing areas being capable of receiving incident radiation and a stacked transmission layer covering the sensing areas; and a plurality of microlenses (30, 30a, 30b, 30c) covering the stacked transmission layer, the size of each microlens (30, 30a, 30b, 30c) being a function of the distance between the microlens (30, 30a, 30b, 30c) to a chip center, (see figure 1, figure 2, paragraph [0010], paragraph [0010]).

As to claim 2, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the sizes of the microlenses (30, 30a, 30b, 30c) are altered based on the distance between the microlenses (30, 30a, 30b, 30c) to the chip center such that the photoenergies received by the sensing areas are more uniform, (see figure 2, paragraph [0012]).

As to claim 3, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the size of each microlens (30, 30a, 30b, 30c)

increases as the distance from the microlens (30, 30a, 30b, 30c) to the chip center increases, (see figure 2, paragraph [0012]).

As to claim 4, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the microlenses (30a, 30b) disposed in the edge region are kept at an original size, (see figure 1, paragraph [0003]).

As to claim 5, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the size of the microlenses (30b, 30c) disposed in the center region is reduced in size by 5-50% as shown in figure 2, (see paragraph [0012]).

As to claim 6, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the size of the microlenses (30b, 30c) disposed in the chip center is reduced by about 20% compared with the size of the microlenses disposed in the chip edge (30a), (see figure 1, figure 2, paragraph [0012]).

As to claim 7, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the sizes of the microlenses (30, 30a, 30b, 30c) are progressively increasing from the chip center to a chip edge such that the brightness in different regions of the chip is balanced, (see figure 1, figure 2, paragraph [0012]).

As to claim 8, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the difference between the sizes of the microlenses (30, 30a, 30b, 30c) disposed in the chip center and in the chip edge is 5-50% as reflected in figure 2, (see paragraph [0012]).

As to claim 9, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the difference between the sizes of the microlenses

(30, 30a, 30b, 30c) disposed in the chip center and in the chip edge is about 20% as reflected in figure 1, figure 2, (see paragraph [0012]).

As to claim 10, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the microlenses (30, 30a, 30b, 30c) are divided into a plurality of groups, and the size of the microlenses in each group is constant, (see figure 1, paragraph [0003]).

As to claim 11, Summa discloses an image sensor (10) embedded, (see figure 1, figure 2, paragraph [0010]).

As to claim 12, Summa discloses an image sensor (10) with improved uniformity of effective incident light with a chip having a plurality of sensing areas being capable of receiving incident radiation; a plurality of color filter units (20) corresponding to each sensing area and disposed overlying the sensing areas; and a plurality of microlenses (30, 30a, 30b, 30c) overlying the color filter units (20), the distance between a center of the microlens (30, 30a, 30b, 30c) and a center of the corresponding sensing area being a function of the distance between the corresponding sensing area to a chip center, each microlens (30a, 30b, 30c) overlying its corresponding color filter unit (20) without overlying adjacent regions, (see figure 2, paragraph [0010]), paragraph [0011]), paragraph [0012]).

As to claim 13, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the distance between the center of each microlens (30, 30a, 30b, 30c) and the center of the corresponding sensing area is altered based on the distance between the corresponding sensing area to a chip center such that the

photoenergies received by the sensing area are more uniform, (see figure 2, paragraph [0012]).

As to claim 14, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the distance between the center of the microlens (30, 30a, 30b, 30c) and the center or the corresponding sensing area increases as the distance between the corresponding sensing area to the chip center increases such that the brightness in different regions of the chip is balanced, (see figure 2, paragraph [0012]).

As to claim 15, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the microlenses (30, 30a, 30b, 30c) are divided into a plurality of groups, and the microlenses in each group have a corresponding constant distance between the center of the microlenses and the center of the sensing area, (see figure 1, figure 2, paragraph [0012]).

As to claim 16, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein the groups at least comprise a first group and a second group adjacent to the first group, the first group closer the chip center than the second group, wherein the microlenses (30, 30a, 30b, 30c) in the second group are shifted by decreasing a gap between two adjacent microlenses (30, 30a, 30b, 30c) belonging to the first and second groups while the other microlenses (30, 30a, 30b, 30c) in the second group are shifted without decreasing the gaps there between, and the color filter units (20) are shifted by reducing the size of the color filter unit belonging to the second group adjacent to another color filter unit (20) belonging to the first group

while the other color filter units (20) in the second group are shifted without reducing their sizes, (see figure 1, figure 2, paragraph [0010]), paragraph [0011]), and paragraph [0012]).

As to claim 17, Summa discloses an image sensor (10) with improved uniformity of effective incident light wherein each group comprises two sensing areas, (see figure 1, figure 2, paragraph [0012]).

As to claim 18, Summa discloses an image sensor (10) with improved uniformity of effective incident light comprising an inherent IC transparent stacked layer between the sensing areas and the color filter units (20), (see figure 2, paragraph [0011]), paragraph [0012]).

As to claim 19, Summa discloses an image sensor (10) embedded, (see figure 2, paragraph [0010]).

As to claim 20, Summa discloses an image sensor (10) built in a chip, with a semiconductor substrate (15); a plurality of sensing areas being capable of receiving incident radiation formed in the semiconductor substrate (15); a plurality of color filter units (20) corresponding to each sensing area and disposed overlying the sensing areas; and a plurality of microlenses (30a, 30b, 30c) overlying the color filter units (20), the distance between a center of the microlens (30, 30a, 30b, 30c) and a center of the corresponding sensing area being a function of the distance between the corresponding sensing area to a chip center, each microlens (30, 30a, 30b, 30c) overlying its corresponding color filter unit (20) without overlying adjacent regions, (see figure 1, figure 2, paragraph [0010]), paragraph [0011]), paragraph [0012]).

As to claim 21, Summa discloses an image sensor (10) wherein the distance between the center of each microlens (30, 30a, 30b, 30c) and the center of the corresponding sensing area is altered based on the distance between the corresponding sensing area to a chip center such that the photoenergies received by the sensing area are more uniform (see figure 2, paragraph [0012]).

As to claim 22, Summa discloses an image sensor (10), wherein the distance between the center of the microlens (30, 30a, 30b, 30c) and the center of the corresponding sensing area increases as the distance between the corresponding sensing area to the chip center increases, (see figure 2, paragraph [0012]).

As to claim 23, Summa discloses an image sensor (10) wherein the microlenses (30, 30a, 30b, 30c) are divided into a plurality of groups, and the microlenses (30, 30a, 30b, 30c) in each group have a corresponding constant distance between the center of the microlenses (30a, 30b, 30c) and the center of the sensing area, (see figure 1, figure 2, paragraph [0012]).

As to claim 24, Summa discloses an image sensor (10) built in a chip with a semiconductor substrate (15); a plurality of sensing areas being capable of receiving incident radiation formed in the semiconductor substrate (15); a stacked inherent transmission layer covering the sensing areas; and a plurality of microlenses (30, 30a, 30b, 30c) covering the stacked inherent transmission layer, the size of each microlens (30, 30a, 30b, 30c) being a function of the distance between the microlens (30, 30a, 30b, 30c) to a chip center, (see figure 2, paragraph [0012]).

As to claim 25, Summa discloses an image sensor (10) wherein the sizes of the

microlenses (30, 30a, 30b, 30c) are altered based on distance between the microlenses (30, 30a, 30b, 30c) to the chip center such that the photoenergies received by the sensing areas are more uniform, (see figure 2, paragraph [0012]).

As to claim 26, Summa discloses an image sensor (10) wherein the size of each microlens (30, 30a, 30b, 30c) increases as the distance between the microlens (30, 30a, 30b, 30c) to the chip center increases, (see figure 2, paragraph [0012]).

As to claim 27, Summa discloses an image sensor (10) wherein the microlenses (30, 30a, 30b, 30c) are divided into a plurality of groups, and the microlenses (30, 30a, 30b, 30c) in each group have a corresponding constant size, (see figure 1, figure 2, paragraph [0003], paragraph [0012]).

Response to Arguments

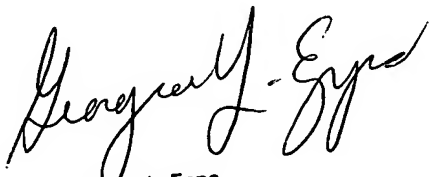
Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Don Williams whose telephone number is 571-272-8538. The examiner can normally be reached on 8:30a.m. to 5:30a.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Georgia Epps
Supervisory Patent Examiner
Technology Center 2800